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Filing Date	July 31, 1998
First Named Inventor	Schoeb, Reto
Group Art Unit	2834
Examiner Name	Tamal, K.
Attorney Docket Number	016258-033700US

ENCLOSURES *(check all that apply)*

- [x] Fee Transmittal Form
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- [ ] Amendment / Response
  - [ ] After Final
  - [ ] Affidavits/declaration(s)
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PATENT
Attorney Docket No.: 015258-033700US
Client Ref. No.: P.6826

#21/Appeal Brief Hawkins 2/22/02

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re application of:

Reto Schoeb

Application No.: 09/127,644

Filed: July 31, 1998

For: MAGNETICALLY JOURNALLED ROTATIONAL ARRANGEMENT INCLUDING A ROTOR FOR GENERATING A UNIPOLAR BIAS MAGNETIC FLUX

Examiner: Tamai, K.

Art Unit: 2834

APPELLANT'S BRIEF UNDER 37 CFR § 1.192(a)

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Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

Appellant hereby submits this Appeal Brief in triplicate pursuant to 37 CFR § 1.192(a). A return receipt postcard received by Appellant indicates that the date of receipt of Appellant's Notice of Appeal is September 18, 2001. Pursuant to 37 CFR § 1.192(a), this Appeal Brief was due on November 18, 2001, extensions of time being permitted. This Appeal Brief is being filed on or before February 18, 2002, and therefore, a three-month extension of time is requested. The fees for the three-month extension of time should be charged by the Commissioner to Deposit Account No. 20-1430.

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I. REAL PARTY IN INTEREST:

The real parties in interest of the subject patent application are Sulzer Electronics AG and Lust Antriebstechnik GmBH.

II. RELATED APPEALS AND INTERFERENCES:

There are no related appeals and intereferences.

III. STATUS OF CLAIMS:

Claims 1, 3-8 and 10-22 are pending. Claims 2 and 9 are canceled. Claims 11-13, 15, 16 and 22 stand allowed. Claims 1, 3-8, 10, 14 and 17-21 stand finally rejected. Appellant appeals from the rejection of claims 1, 3-8, 10, 14 and 17-21.

IV. STATUS OF AMENDMENTS:

An Amendment Under 37 CFR § 1.116 Expedited Procedure was filed on August 8, 2001, subsequent to the final rejection in the Office Action mailed April 9, 2001 ("The final Office Action"). The amendment and corresponding requests for reconsideration was considered, but was deemed to not place the application in condition for allowance. For purposes of appeal, the proposed amendment(s) was indicated to be entered.

V. SUMMARY OF THE INVENTION:

The present invention is aimed at providing a magnetically journalled rotational arrangement by means of which a magnetic journalling as well as a rotation of the rotor may be produced at the same time. Such a magnetically journalled rotational arrangement is generally uncomplicated and inexpensive.

According to the present invention, a magnetically journalled rotational arrangement includes a substantially disk-shaped or ring-shaped magnetically journalled rotorand a stator that comprises means for the production of a field that produces a

rotation of the rotor. The rotor includes means that generate a unipolar bias magnetic flux that is spaciously modulated when viewed in the circumferential direction.

VI. ISSUES PRESENTED:

Issues on appeal are:

Are claims 1, 4, 8, 10 and 14 obvious in view of Nichols et al. (WO 97/15978) and Lyman (U.S. Patent No. 4,043,614)?

Are claims 1, 3, 4, 5, 8, 10 and 14 obvious in view of Shimamoto (EPO 0 130 541 A1) and Scheller (U.S. Patent No. 4,668,885)?

VII. GROUPING OF CLAIMS:

Appellant submits that the rejected claims that depend on independent claim 1 recite additional features that further distinguish the claimed invention from the prior art. However, for purposes of this appeal, the claims may stand or fall on independent claim 1.

VIII. ARGUMENT

Claims 1, 4, 8, 10 and 14 were finally rejected under 35 U.S.C. § 103(a) as being unpatentable over Nichols et al. (WO 97/15978) and Lyman (U.S. Patent No. 4,043,614). Additionally, claims 1, 3, 4, 5, 8, 10 and 14 were finally rejected under 35 U.S.C. § 103(a) as being unpatentable over Shimamoto (EPO 0 130 541 A1) and Scheller (U.S. Patent No. 4,668,885). Since claim 1 is the only independent claim on appeal and since, for purposes of this appeal, the other appealed claims may stand or fall on independent claim 1, the relevant portions of the final Office Action with regard to independent claim 1 are recited below.

With regard to the Section 103 rejection in view of Nichols and Lyman, the Examiner stated:

Nichols teaches a magnetically levitated ring shaped rotor which the stator having axially aligned levitating magnets and circumferentially disposed field windings 40 to rotate the rotor. Nichols teaches unipolar rotor flux in the ferromagnetic, reluctance poles of the rotor which close the magnetic circuit with the stator bearing magnets 38. Nichols teaches control windings 42 on the stator to control the unipolar magnetic bearing flux. Nichols teaches every aspect of the invention, except permanent magnets on the rotor creating unipolar magnetic bearing flux and an additional stator (or two) in a plane parallel with bearing plane. Lyman teaches an axially oriented permanent magnet 31 on the rotor to provide magnetic bearing flux across the air gap with the stator. Lyman teaches the rotor can be either disk shaped inside the ring shaped stator or the rotor can be ring shaped outside the stator. Lyman teaches a plurality of stators in parallel to provide magnetic bearing support to the rotor. Lyman does not teach a plurality of magnets on the arranged on the disk shaped rotor. Nichols teaches the permanent magnet producing the bearing flux being four circumferentially, spatially modulated magnets 38a rather than a single permanent magnet. It would have been obvious to a person skilled in the art at the time of the invention to construct the motor of Nichols with the permanent magnet on the rotor as in Lyman to efficiency support a rotor with a large moment of inertia, and with a first and second stator in parallel with the bearing plane because Lyman teaches a plurality of bearing disks provide additional support to rotor.

With regard to the Section 103 rejection in view of Smimamoto and Scheller, the Examiner stated:

Shimamoto teaches annular rings on the rotor and stator with a unipolar flux journal, where the stator includes a means to produce a field 30 for the rotation of the rotor. Shimamoto teaches control windings 82, 84, 86, 88 to control the magnet journal flux. Shimamoto teaches an axially magnetized permanent magnets 62/64 on the stator having control windings 88 and axially magnetized permanent magnets 70/72 on the rotor, where the permanent magnets 62/64 and 70/72 are positioned on opposite sides of a rotor ring 56 and stator disk 48. Shimamoto teaches rings 66 and 68 which are parallel to the bearing plane at 46. Shimamoto teaches a disc shaped motor stator 16 which is parallel to the bearing plane. Shimamoto does not teach the magnets being spatially modulated. Scheller teaches a plurality of spatially modulated magnets 10 are equivalent to an annular ring magnet. It would have been obvious to a person skilled in the art at the time of the invention to construct the motor

Shimamoto was spatially modulated magnets because Scheller teaches a plurality of spatially modulated magnets are simple and easy to manufacture.

A. The Section 103 Rejection Over Nichols In View Of Lyman

With regard to claim 1, the Examiner contends that Nichols would disclose the claimed invention except for the permanent magnets distributedly arranged on the rotor and since permanent magnets on the rotor are known from Lyman, it would have been obvious to construct the Nichols system with permanent magnets on the rotor.

Appellant respectfully disagrees for the following reasons.

i. No Motivation To Combine

The Examiner does not show a motivation to combine Nichols and Lyman necessary to create the case of obviousness. The court held in *In re Rouffet* 149 F.3d 1350, 1357 (1998) that the examiner must show reasons that the skilled artisan, confronted with the same problems as the inventor and with no knowledge of the claimed invention, would select the elements from the cited prior art references for combination in the manner claimed, pointing out that the suggestion to combine requirement stands as a critical safeguard against hindsight analysis and rote application of the legal test for obviousness. The examiner did not identify any motivation to choose Nichols and Lyman for combination, except for showing that the elements of both Nichols and Lyman are present in the claimed invention. See page 7, lines 10-11 of the office action: "Nichols teaches the unipolar rotor journalled to the stator. Lyman merely teaches including a permanent magnet on the rotor." The court in *In re Rouffet* makes it clear that finding every element of claimed invention in the prior art is not a sufficient ground to claim obviousness, and that most if not all inventions are combinations of old elements, and if identification of each claimed element in the prior art were sufficient to negate patentability, very few patents would ever issue. *Id*, 1357. The court further states that rejecting patents solely by finding prior art corollaries for the claimed elements would permit an examiner to use the claimed invention itself as a blueprint for piecing together

elements in the prior art to defeat the patentability of the claimed invention. *Sensonics, Inc. v. Aerosonics Corp.*, 81 F.3d 1566,1570 (Fed. Cir. 1996).

Nichols does not teach generating an inhomogeneous bias flux by permanent magnets on the rotor. Nichols teaches generating the biased magnetic flux in the stator, not in the rotor. Furthermore, Nichols accomplishes the inhomogenuety of the biased magnetic flux by means of the geometric design of the rotor, not by permanent magnets. Nichols does not teach using permanent magnets on the rotor for accomplishing inhomogenuety of the biased magnetic flux, neither does Lyman. Lyman does not teach generating an inhomogeneous unipolar bias magnetic flux on the rotor. While Lyman teaches using permanent magnets on the rotor, the objective of Lyman is to make the biased magnetic flux as homogeneous as possible for the disclosed magnetic suspension system, and any possible disturbance of homogenuety of the flux is characterized by Lyman as an undesirable secondary effect adverse to the objectives of the invention. Lyman suggests that it should be minimized and further suggests how the net unbalanced contribution of permanent magnets, and the flux induced thereby shall be compensated. See col. 1, lines 41-42, col. 3, lines 37-42, col. 5, lines 63-66, col. 6, col. 32-40 of Lyman.

The Examiner states "The fact that Lyman teaches a homogeneous flux does not prevent Lyman from suggesting that the magnet would be included on the rotor for other purposes..." The court in *Gore* held that a prior art reference must be considered in its entirety, as a whole, including portions that would lead away from the claimed invention. *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540 (Fed. Cir. 1983). The Examiner's statement quoted above indicates that Lyman's invention was not considered in its entirety, including the portions that would lead away from claimed invention, namely Lyman's indication that inhomogenuety of the biased magnetic flux in the rotor should be minimized.

It is, therefore, clear in view of these references, each in its entirety, that a person of ordinary skill confronted with the problem of accomplishing inhomogeneous magnetic flux in the rotor would be deterred from any investigation into the combination of references since one reference teaches minimizing inhomogenuety of magnetic flux in

the rotor (Lyman), while the other does not teach generating any inhomogenuety of magnetic flux in the rotor at all (Nichols).

ii. The Combination Fails

Even if the references were combined as suggested by examiner, the combination fails to make obvious the pending claims.

The Examiner cites Nichols for teaching a unipolar rotor journalled to the stator, and Lyman for using permanent magnets on the rotor to generate an inhomogeneous magnetic flux in the rotor. Thus according to the Examiner, Lyman would make up for the deficiencies in Nichols. Appellant respectfully disagrees with the Examiner's analysis. Nichols teaches that the bias magnetic flux is generated in the stator, while Lyman teaches a preferably homogenous magnetic field in the rotor. In contrast, the claimed invention discloses generating inhomogeneous unipolar bias magnetic flux on the rotor by means of permanent magnets on the rotor such that the bias magnetic flux is inhomogeneous at the axially upper and lower part of the rotor and homogeneous in the middle section where the ring 10 is located. Thus, the bearing forces controlled by stator 21 can act upon the homogeneous part of the rotor, whereas the driving forces generated by stator 22 and stator 23 can act upon the inhomogeneous part of the rotor, and, therefore both requirements of a homogeneous flux for the bearing function and inhomogeneous flux for the driving function are concurrently fulfilled. Neither of the cited references teaches or even mentions generating inhomogeneous magnetic flux on the rotor by means of the permanent magnets. Therefore, even if the teachings of Nichols and Lyman were combined, they do not even suggest what to do with the resulting system. Only the present patent application discusses generating inhomogeneous unipolar bias magnetic flux on the rotor by means of permanent magnets on the rotor such that the bias magnetic flux is inhomogeneous at the axially upper and lower part of the rotor and homogeneous in the middle section. It is thus apparent that the Examiner used an impermissible hindsight by using the Appellant's own disclosure to

provide motivation to combine Nichols's reluctance motor with the missing disclosure of using permanent magnets on the rotor from the above combination.

Accordingly, it respectfully submitted that one skilled in the art would not be motivated to combine the teachings of Nichols and Lyman in order to arrive at the present invention, and even if these references where combined, their combination would not result in a system as recited in claim 1. Accordingly, it is respectfully submitted that this Section 103 rejection with regard to claim 1 is improper.

B. The Section 103 Rejection Over Shimamoto In View of Scheller

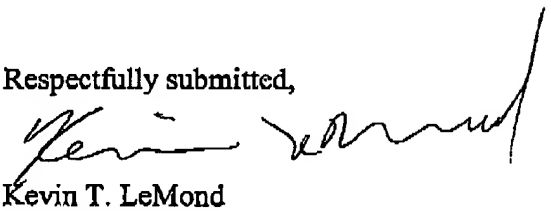
It is respectfully submitted that Shimamoto does not propose to generate an inhomogeneous unipolar bias magnetic flux. Shimamoto provides separate drive means, both in the rotor and in the stator for driving the rotor. The Examiner states that in Sheller the magnetic flux is inherently spatially modulated between the magnets, because Sheller teaches a ring magnet constructed from a plurality of magnets that are "closely spaced, or if necessary may be somewhat separated" col. 3, lines 29-30. We disagree with the Examiner's statement that Sheller teaches an inhomogeneous magnetic flux. Even if the magnetic field is to some extent spatially modulated between the magnets, due to the structure of the system, this effect, as in Lyman, is adverse to the objective of the invention, and is not taught as a feature of the invention. As was shown before, Sheller discloses a flywheel that requires a homogeneous magnetic flux to function as disclosed. Therefore it is respectfully submitted that one skilled in the art would not be motivated to combine the teachings of Shimamoto and Scheller for accomplishing an inhomogeneous magnetic flux on the rotor by means of permanent magnets on the rotor. But even if the teachings of Shimamoto and Scheller were combined, there is no disclosure at all in either reference to generate an inhomogeneous unipolar bias magnetic flux.

Accordingly, since neither Shimamoto nor Scheller, either alone or in combination, teach, disclose or suggest a magnetically journalled rotational arrangement as recited in claim 1, this Section 103 rejection with regard to claim 1 is improper.

IX. CONCLUSION

The obviousness rejections are improper because one skilled in the art would not be motivated to combine any of the cited references. Furthermore, combination of the cited references would not result in the present invention. Applicants respectfully request that both rejections as to all claims on appeal be reversed.

Respectfully submitted,



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Reto Schoeb
Application No.: 09/127,644

PATENT
Attorney Docket No.: 015258-033700US

CLAIMS APPENDIX

1. (Finally Rejected) A magnetically journalled rotational arrangement comprising a substantially disc-shaped or ring-shaped magnetically journalled rotor and a stator which comprises means for the production of a field which produces a rotation of the rotor, wherein the rotor has means which generate a unipolar bias magnetic flux which is spatially modulated when viewed in the circumferential direction, wherein the means which generate a unipolar bias magnetic flux comprise premanent magnets which are distributedly arranged on the substantially disc-shaped or ring-shaped rotor.

2. CANCELED

3. (Finally Rejected) A rotational arrangement in accordance with claim 1 wherein the permanent magnets are arranged at both sides of the disc-shaped or ring-shaped rotor.

4. (Finally Rejected) A rotational arrangement in accordance with claim 1 wherein the permanent magnets have an axial or a radial magnetization.

5. (Finally Rejected) A rotational arrangement in accordance with claim 1 wherein permanent magnets are provided both on the rotor and on the stator; and wherein both the permanent magnets provided on the rotor and the permanent magnets arranged on the stator are magnetized in the axial direction.

6. (Finally Rejected) A rotational arrangement in accordance with claim 1 wherein permanent magnets are provided both on the rotor and on the stator; and wherein both the permanent magnets provided on the rotor and the permanent magnets arranged on the stator are magnetized in the radial direction.

7. (Finally Rejected) A rotational arrangement in accordance with claim 1 wherein permanent magnets are provided both on the rotor and on the stator; and wherein the permanent magnets provided on the rotor are magnetized in the axial direction while the permanent magnets arranged on the stator are magnetized in the radial direction or vise versa.

8. (Finally Rejected) A rotational arrangement in accordance with claim 1 wherein, in addition to the means for the production of the field which produces the rotation of the rotor, the stator comprises permanent magnets which are arranged in such a manner that they cooperate with the means provided on the rotor for the production of the spatially modulated bias magnetic flux in such a manner that they produce or reinforce the magnetic journalling of the rotor.

9. CANCELED

10. (Finally Rejected) A rotational arrangement in accordance with claim 1 wherein control windings are provided in the stator in order to control the spatially modulated unipolar bias magnetic flux.

11. (Allowed) A magnetically journalled rotational arrangement comprising a substantially disc-shaped or ring-shaped magnetically journalled rotor and

a stator comprising:

means for generating a field, wherein said field produces rotation of the rotor having means for generating a unipolar bias magnetic flux spatially modulated when viewed in the circumferential direction; and

a plurality of permanent magnets arranged to cooperate with the means provided on the rotor generating the spatially modulated bias magnetic flux and producing or reinforcing the magnetic journalling of the rotor,

wherein the stator effecting the magnetic journalling of the rotor is designed substantially in ring shape and surrounds the ring or disc-shaped rotor,

wherein the stator plane and the rotor plane coincide and from a bearing plane, and

wherein the means for generating the field are arranged in the segments between the permanent magnets in the stator so that the motor plane in which the rotation of the rotor is produced and the bearing plane in which the journalling of the rotor is produced coincide.

12. (Allowed) A rotational arrangement in accordance with claim 11 wherein the means for the production of the field which effects the rotation of the rotor and which is arranged in the segments between the permanent magnets has U-shaped coil cores with windings, with the U-shaped coil cores being arranged in the bearing plane.

13. (Allowed) A rotational arrangement in accordance with claim 11 wherein the means for the production of the field which effects the rotation of the rotor and which is arranged in the segments between the permanent magnets has U-shaped coil cores with windings, with the U-shaped coil cores being arranged perpendicular to the bearing plane.

14. (Finally Rejected) A rotational arrangement in accordance with claim 8 wherein the stator producing the magnetic journalling of the rotor is designed to be substantially ring-shaped and surrounds the ring or disc-shaped rotor, with the stator plane and the rotor plane coinciding and forming the bearing plane; and wherein moreover the stator comprises at least one further ring or disc-shaped motor stator which is arranged in a motor plane parallel to the bearing plane.

15. (Allowed) A magnetically journalled rotational arrangement comprising a substantially disc-shaped or ring-shaped magnetically journalled rotor and

a stator comprising:

means for generating a field, wherein said field produces rotation of the rotor having means for generating a unipolar bias magnetic flux spatially modulated when viewed in the circumferential direction; and

a plurality of permanent magnets arranged on both sides of the rotor to cooperate with the means provided on the rotor generating the spatially modulated bias magnetic flux and producing or reinforcing the magnetic journalling of the rotor,

wherein the stator plane and the rotor plane coincide and from a bearing plane, and

wherein the stator producing the magnetic journalling of the rotor is designed to be substantially ring-shaped and surrounds the ring or disc-shaped rotor, and

the stator further comprises two ring-shaped motor stators, wherein the first motor stator is arranged in a first motor plane parallel to the bearing plane on the one side of the bearing stator and the second motor stator in a second motor plane parallel to the bearing plane.

16. (Allowed) A magnetically journalled rotational arrangement comprising a substantially disc-shaped or ring-shaped magnetically journalled rotor and

a stator comprising:

means for generating a field, wherein said field produces rotation of the rotor having means for generating a unipolar bias magnetic flux spatially modulated when viewed in the circumferential direction; and

a plurality of permanent magnets arranged to cooperate with the means provided on the rotor generating the spatially modulated bias magnetic flux and producing or reinforcing the magnetic journalling of the rotor,

wherein the stator plane and the rotor plane coincide and from a bearing plane, and

wherein the stator producing the magnetic journalling of the rotor is designed to be substantially ring-shaped and surrounds the ring or disc-shaped rotor, and

the stator further comprises a disc-shaped motor having a disc rotor winding and arranged in a motor plane parallel to the bearing plane.

17. (Finally Rejected) A rotational arrangement in accordance with claim 8 wherein the means for the production of the field which effects the rotation of the rotor comprises a rotatable drive which can be magnetically coupled to the rotor and the axis of rotation of which coincides with the axis of rotation of the rotor.

18. (Finally Rejected) A rotational arrangement in accordance with claim 17 wherein the drive comprises permanent magnets which are magnetized in the axial direction.

19. (Finally Rejected) A rotational arrangement in accordance with claim 17 wherein the drive comprises permanent magnets which are magnetized in the radial direction.

20. (Finally Rejected) A forwarding apparatus, in particular for highly pure or biological liquids, especially a blood pump, with a rotational arrangement in accordance with claim 1.

21. (Finally Rejected) A stirrer for a bio-reactor comprising a rotational arrangement in accordance with claim 1.

22. (Allowed) A rotational arrangement in accordance with claim 16 wherein the disc rotor winding is iron-less.

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